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# Radiative Forcing CaIculations for $CH_3Cl$ and $CH_3Br$

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## Abstract

Methyl chloride, $CH_3Cl$, and methyl bromide, $CH_3Br$, are particularly important in the global atmosphere as major natural sources of chlorine and bromine to the stratosphere. We will estimate the radiative forcing and Global Warming Potentials (GWPs) of $CH_3Cl$ and $CH_3Br$. Our calculations use an infrared radiative transfer model based on the correlated k-distribution algorithm. Radiative forcing values of 0.0047 $W/m^2$ per ppbv for $CH_3Cl$ in the troposphere and 0.0049 $W/m^2$ per ppbv for $CH_3Br$ in the troposphere were obtained. The radiative forcing values are about 2 percent of the forcing of CFC-11 and about 270 times the forcing of $CO_2$, on a per molecule basis. The Global Warming Potentials of $CH_3Cl$ and $CH_3Br$ were determined giving GWPs of about 8 for $CH_3Cl$ and about 4 for $CH_3Br$ for a time integration of 100 years ($CO_2$ = 1). The results indicate that while $CH_3Cl$ and$CH_3Br$ have direct GWPs similar to that of $CH_4$, the current emission rates are too low to meaningfully contribute to atmospheric greenhouse heating effects.

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